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ABSTRACT

Described is "Project SOSO" designed to help elementary teachers improve methods for teaching arithmetic to low achievers in the sixth grade. The project developed methods and primarily free and/or inexpensive materials for teaching whole numbers, fractions, number theory, geometry, and probability. Preliminary results indicate that low achievers' understanding of certain concepts is aided by multisensory devices, and their attitudes toward arithmetic have improved through participation in the project. (JG)

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PROJECT SOSO (SAVE OUR SLOW ONES)

During the spring semester, 1970, three members of the Mathematics Department of Delta State College were asked by the Greenwood, Mississippi City School System to come and work with a group of elementary teachers who were teaching low achieving students at the sixth grade level. As a result of this teaching experience, a request was made to Delta State College for a small research grant from state funds allocated to colleges for such purposes. College officials were enthusiastic about the project and granted this request. Thus work began on Project SOSO (Save Our Slow Ones) June 30, 1970, and is scheduled to be completed by June 30, 1971. Basically, this project was designed to help elementary teachers improve methods and techniques for teaching low achieving students in arithmetic.

Purposes

The purposes of this educational research project were:

1. To develop curriculum content and materials which could be used in in-service and pre-service training of elementary teachers who teach students who may be classified as low achievers in elementary arithmetic.

2. To initiate and carry out a pilot program, using the content and materials developed, in cooperation with a public school in the proximity of Delta State College.

3. To plan and offer by summer, 1971, a course in the Mathematics Department of Delta State College, using the curriculum methods and materials developed in the project.

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4. To evaluate the use of the developed curriculum materials and methods in an attempt to determine the educational value of the project.

Procedures

The summer of 1970 was spent in developing the content and materials of Project SOSO. First,curriculum materials and content descriptions of similar projects were secured. Persons involved in these projects were contacted and available materials were obtained. Studies were made of current books, journals and periodicals to get additional information. The project centered around the development of seven short teaching units, emphasizing particular arithmetic operations and geometrical concepts usually taught at the sixth grade level. These units included: the four fundamental operations with whole numbers, the four fundamental operations with fractional numbers, number theory, geometry and probability.

Although these materials were designed primarily for teachers of low achievers, the units included sample lesson and multisensory devices which could be used by the students in the development of the mathematical concepts. Throughout the project the hypothesis has been:

A student will understand a mathematical concept better if he has a visual representation or a concrete object at hand when the concept is introduced.

Consequently, the major emphasis has been on the use of multisensory devices. Each time a concept is introduced, the teacher and the student have a concrete object or some visual representation to illustrate that concept. Particular emphasis has been placed on the use of free and/or inexpensive materials. Business firms in Cleveland, Mississippi, were enthusiastic about the project and donated scrap materials which could

be used as visual aids. For example, Baster Laboratories donated plastic tubing and pegs which have been useful in the development of the unit on geometry. Misceramic Tile Plant contributed tiles of various sizes which have been useful in developing the concept of sets, operations with sets, prime numbers, multiplication of fractions and areas of certain geometric figures.

Other materials which have been a vital part of the project have been plastic straws, scrap lumber (for construction of the spike abaci), popsicle sticks, tongue depressors, cardboard and construction paper. Certain geometric concepts such as point, line, ray, half-line, angle, intersecting lines, parallel lines, triangles, quadrilaterals and line segments have been easy to illustrate through the use of Tinkertoys.

Other commercially prepared materials were used in the development of these teaching units, such as counters, numberlines, fractional parts, Cuisenaire Rods and blocks. The major emphasis, however, has been on the use of free and/or inexpensive materials. In many instances, these devices can be constructed by the student under the direction of the elementary arithmetic teacher.

The Pilot School

On October 2, 1970, the research team from Delta State College began working with sixteen low achieving sixth grade students selected from Pearman Elementary School in Cleveland. These students were selected by the Superintendent of District IV Schools, Dr. Woodrow Marsh, the Principal of Pearman Elementary School, Mr. Tommy Waldrup, and the sixth grade arithmetic teacher, Mrs. Robert Crain. The students selected for Project SOSO have Intelligence Quotient scores from 66 to 104, achievement scores in arithmetic (at the end of the fifth grade)

below the 30th percentile, and the recommendation of the sixth grade teacher. There were ten white students (two from one of the most prominent families in the Cleveland area), five blacks (only one of these could be classed as truly as culturally deprived or disadvantaged), and one Chinese boy.

The teacher has done a marvelous job of preparing the children for the project, and they came the first day highly enthusiastic about Project SOSO. The research team met with these students a forty-five minute period twice a week until March 4, 1971, in a portable classroom adjoining Pearman Elementary School.

At the first meeting each child was given his very own "survival kit," which included materials he would need in his work. Other materials and visual aids were added to this kit as the project progressed. Having his own kit gave each child a great deal of pleasure and security.

The following observations were made as the team worked with these students:

1. At first, the children were awkward in manipulating the multisensory devices. Gradually, they became more comfortable and excited with these devices and expected a multisensory device when a new concept was introduced.

2. The children were always highly enthusiastic about their work. They were never shy with the research team and constantly wanted to show the team how well they could perform.

3. The overhead projector fascinated the children. They always wanted to work with the projector when it was being used by the research team.

4. Frequent changes in activities were necessary to hold their interest and enthusiasm.

5. Visual aids helped in the understanding of certain concepts, particularly the operations with fractional numbers. The understanding of concepts was more clearly observed when the work in Project SOSO correlated with the regular classroom work.

6. The regular teacher noticed a change in the children's attitude toward arithmetic before the end of this phase of Project SOSO.

7. Low achievers can use manipulative devices very successfully when being introduced to certain concepts of arithmetic.

Teacher Response to Project SOSO

Many of the materials developed in Project SOSO have been used in in-service courses with teachers in the counties in the proximity of Delta State College. They have been enthusiastic about the multisensory devices, and many have returned to their classrooms and used these materials. Some of the multisensory devices which have been most popular with the teachers are the Tinkertoys, geoboards, the tiles, and the spike abaci.

At the present time, plans are being formulated to offer a twelve day workshop for elementary teachers of arithmetic from June 17-July 2, 1971. This workshop will carry three semester hours of graduate or undergraduate credit, and the enrollment will be limited to approximately thirty elementary arithmetic teachers and/or supervisors from the community served by Delta State College. The curriculum materials and multisensory devices used in the workshop will be those developed in Project SOSO.

During the morning session, the teacher will participate in a discussion of techniques and methods of presenting the content to low achieving students. Included in this morning period will be demonstrations of multisensory devices which can be used by the teacher in presenting the content. The afternoon meeting will be a laboratory session in which the workshop participants will go into the mathematics laboratory and construct a quantity of multisensory devices sufficient for use in their own classrooms.

An attempt will be made during the school year 1971-1972 to determine the effectiveness of the work done by the research team of Project SOSO in Pearman Elementary School and the effectiveness of the summer workshop in preparing teachers to work with low achieving students in their respective classrooms. Further information about Project SOSO may be obtained by writing to: Dr. Daisy Howell, Director, Mathematics Department, Delta State College, Cleveland, Mississippi, 38732.